

Claims

What is claimed is:

1. A method, performed on a computer system, for tracking time using
5 portable recorders and speech recognition, the method comprising the steps of:
 accessing speech data;
 recognizing at least two voice commands from the speech data, each voice
command occurring at a different time;
 determining a first time associated with a first of the voice commands; and
10 determining a second time associated with a second of the voice
commands.

2. The method of claim 1, wherein the second voice command is implied
because a predetermined time from the first voice command elapses before another voice
15 command occurs or because a predetermined ending time occurs and there is no voice
command after the first voice command but before the predetermined ending time, and
wherein the step of determining a second time comprises the step of assigning the second
time as the predetermined time plus the first time, if the first voice command elapses
before another voice command occurs, or as the predetermined ending time, if the
20 predetermined ending time occurs and there is no voice command after the first voice
command but before the predetermined ending time.

3. The method of claim 1, wherein:
 the speech data comprises a time stamp;
25 the step of determining a first time comprises:

determining an offset time between the time stamp and a time when the first voice command is active; and

determining the first time through reference to the time stamp and the offset time.

5

4. The method of claim 1, wherein:

the speech data comprises a time stamp;

the step of determining a first time comprises:

10 determining an offset time between the time stamp and a time when the first voice command is active; and

determining the first time through reference to the time stamp and the offset time; and

the step of determining a second time comprises:

15 determining a second offset time between the time stamp and a time when the second voice command is active; and

determining the second time through reference to the time stamp and the second offset time.

5. The method of claim 4, wherein:

20 the step of determining the first time through reference to the time stamp and the offset time comprises the step of adding the offset time to the time stamp to determine the first time; and

25 the step of determining the second time through reference to the time stamp and the second offset time comprises the step of adding the second offset time to the time stamp to determine the second time.

6. The method of claim 1, wherein:
the speech data comprises first and second time stamps;
the step of determining a first time comprises:
determining a first offset time between the first time stamp
and a time when the first voice command is active; and
determining the first time through reference to the first time
stamp and the first offset time; and
the step of determining a second time comprises:
determining a second offset time between the second time
stamp and a time when the second voice command is active; and
determining the second time through reference to the
second time stamp and the second offset time.
7. The method of claim 1, further comprising the steps of:
recording speech onto a portable recorder; and
loading the speech data from the portable recorder to the computer system,
the speech data comprising the speech and a plurality of time stamps.
8. The method of claim 1, further comprising the steps of:
converting each of the at least two voice commands to text; and
determining at least one task name from text of the at least two voice
commands.
9. The method of claim 8, further comprising the step of determining text
versions of the at least two voice commands by comparing words in the text with phrase
grammar rules.

10. The method of claim 8, wherein the step of determining at least one task name comprises finding the at least one task name in the text.

5 11. The method of claim 8, wherein the step of determining at least one task name comprises associating at least one task name to a time period between the first and second times, wherein the at least one task name is not in the text.

10 12. The method of claim 8, wherein the at least one task name comprises two task names, a first task name associated with a first of the voice commands and a second task name associated with a second of the voice commands, wherein the first and second voice commands occur adjacent to each other in time, wherein the first and second task name are different, and wherein the second voice command is assumed to end a first task corresponding to the first task name and start a second task corresponding to the second task name.

15 13. The method of claim 8, further comprising the step of packaging the first time, second time, and one task name from the at least one task name into a time increment.

20 14. The method of claim 8, wherein the at least two voice commands comprises a plurality of voice commands, wherein the at least one task name comprises a plurality of task names, and wherein the method further comprises the steps of:

25 determining an additional plurality of voice command times, each of the voice command times associated with one of the plurality of additional voice command times;

converting each of the plurality of voice commands to text;

determining a plurality of task names from the text;
associating a task name with two of the first time, second time, or additional plurality of voice command times;
creating a plurality of time increments, each time increment comprising
5 two times of the first time, second time, or additional plurality of voice command times and a task name; and
storing the plurality of time increments.

15. A method, performed on a computer system, for tracking time using
10 portable recorders and speech recognition, the method comprising the steps of:
accessing speech data comprising a plurality of time stamps and speech;
converting the speech to text;
composing a plurality of voice commands from words in the text, each
voice command corresponding to a phrase grammar rule;
15 determining a time associated with each of the voice commands;
determining a plurality of tasks, each task associated with at least one of
the times and at least one of the voice commands; and
determining a plurality of time increments, each time increment
comprising one of the tasks and at least one of the times.

20
16. The method of claim 15, wherein the step of determining a plurality of tasks comprises determining a task name for each of the plurality of tasks, wherein first and second voice commands occur adjacent to each other in time, wherein a first task name is associated with the first voice command and a second task name is associated
25 with the second command, wherein the first and second task name are different, and wherein the second voice command is assumed to end a first task corresponding to the

first task name and start a second task corresponding to the second task name.

17. The method of claim 15, wherein:

the speech data comprises a first time stamp;

5 the step of determining a time comprises:

determining a first offset time between the first time stamp
and a time when the first voice command is active; and

determining the first time through reference to the first time
stamp and the first offset time.

10

18. The method of claim 15, further comprising the steps of:

recording speech onto a portable recorder; and

loading the speech data from the portable recorder to the computer system,
the speech data comprising the speech and the plurality of time stamps.

15

19. A system for tracking time using portable recorders and speech recognition
the system comprising:

a computer system comprising:

a memory that stores computer-readable code; and

20

a processor operatively coupled to the memory, the
processor configured to implement the computer-readable code, the
computer-readable code configured to:

access speech data;

25

recognize at least two voice commands from the speech
data, each voice command occurring at a different time;

determine a first time associated with a first of the voice

commands; and

determine a second time associated with a second of the voice commands.

5 20. The system of claim 19, wherein the speech data comprises a time stamp, and wherein the computer-readable code is further configured to:

when determining a first time:

determining an offset time between the time stamp and a time when the first voice command is active; and

10 determining the first time through reference to the time stamp and the offset time; and

the step of determining a second time comprises:

determining a second offset time between the time stamp and a time when the second voice command is active; and

15 determining the second time through reference to the time stamp and the second offset time.

21. The system of claim 19, wherein the computer-readable code is further configured to:

20 store the time increments; and

place the time increments into a file having a format suitable for importing into a time and billing program.

22. The system of claim 19, wherein the system further comprises a digital
25 personal recorder and wherein the computer-readable code is further configured to receive the speech data from the digital personal recorder.

23. The system of claim 19, wherein the computer-readable code is further configured to:

convert each of the at least two voice commands to text; and

5 determine text versions of the at least two voice commands by comparing words in the text with phrase grammar rules.

24. A system for tracking time using portable recorders and speech recognition the system comprising:

a computer system comprising:

10 a memory that stores computer-readable code; and

a processor operatively coupled to the memory, the processor configured to implement the computer-readable code, the computer-readable code configured to:

15 access speech data comprising a plurality of time stamps and speech;

convert the speech to text;

compose a plurality of voice commands from words in the text, each voice command corresponding to a phrase grammar rule;

20 determine a time associated with each of the voice commands;

determine a plurality of tasks, each task associated with at least one of the times and at least one of the voice commands; and

determine a plurality of time increments, each time increment comprising one of the tasks and at least one of the times.

25

25. The system of claim 24, wherein the computer-readable code is further configured to:

store the time increments; and

5 place the time increments into a file having a format
suitable for importing into a time and billing program.

26. The system of claim 24, wherein the system further comprises a digital personal recorder and wherein the computer-readable code is further configured to receive the speech data from the digital personal recorder.

10

27. An article of manufacture comprising:

a computer readable medium having computer readable code means embodied thereon, the computer readable program code means comprising:

a step to access speech data;

15 a step to recognize at least two voice commands from the speech data,
each voice command occurring at a different time;

a step to determine a first time associated with a first of the voice commands; and

20 a step to determine a second time associated with a second of the voice
commands.

28. An article of manufacture comprising:

a computer readable medium having computer readable code means embodied thereon, the computer readable program code means comprising:

25 a step to access speech data comprising a plurality of time stamps and
speech;

a step to convert the speech to text;

a step to compose a plurality of voice commands from words in the text,
each voice command corresponding to a phrase grammar rule;

a step to determine a time associated with each of the voice commands;

- a step to determine a plurality of tasks, each task associated with at least
5 one of the times and at least one of the voice commands; and

a step to determine a plurality of time increments, each time increment
comprising one of the tasks and at least one of the times.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100